

REMARKS

The Examiner has objected to claims 5-12, 17-24, 29-36, 38, 39, and 45-47 for informalities. The Examiner has rejected claims 1, 3, 5-7, 13, 15, 17-19, 25, 27, 29-31, 37, 39, 41, and 42 under 35 U.S.C. § 103(a) as being unpatentable over Polley et al., U.S. Patent No. 5,999,563 (*Polley*) in view of Kantschuk et al., U.S. Patent No. 7,046,751 (*Kantschuk*). Of these, claims 1, 13, 25, and 37 are the only independent claims. The Examiner has rejected claims 2, 14, 26, and 38 under 35 U.S.C. § 103(a) as being unpatentable over *Polley* in view of *Kantschuk* and Pakravan et al., U.S. Patent No. 6,259, 391 (*Pakravan*). The Examiner has objected to claims 8-12, 20-24, 32-36, and 45-47 as being dependent upon a rejected claim, but has indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Objections

Applicants have amended claims 5, 6, 8, 11, 17, 18, 23, 29-32, 35, 38, 43 and 44 as indicated by the Examiner to overcome the objections to claims 5-12, 17-24, 29-36, 38, 39, and 45-47 due to informalities. Accordingly, Applicants respectfully request that these objections be withdrawn. Additionally, Applicants have rewritten dependent claims 8, 20, 32 and 45 in independent form, overcoming the objections to claims 8-12, 20-24, 32-36, and 45-47. As indicated by the Examiner, these claims contain allowable subject matter. Therefore, Applicants submit that the objections to these claims have been overcome and the claims now in a form for allowance. Their allowance is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1, 3, 5-7, 13, 15, 17-19, 25, 27, 29-31, 37, 39, 41 and 42 as being unpatentable over *Polley* in view of *Kantschuk*. Of these claims, claims 1, 13, 25, and 37 are the only independent claims. These independent claims have been amended to include limitations, for example as in claim 1, of multiplying a transmitted symbol vector at the transmitters by a pre-processing matrix to generate multiplied transmitted vectors, and multiplying received symbols at the receivers by a post-processing

matrix. Additionally, language was added to the claims clarifying that the interference includes FEXT (far end crosstalk), which the exploitation reduces.

With reference to claim 1, the Examiner contends that *Polley* teaches the method of the claim except for exploiting a correlation between measured interference noise values across two or more of the receivers to reduce interference noise in the physical layer signals. The Examiner further contends that *Kantschuk* teaches, in the same field of endeavor, exploiting a correlation between measured interference noise values. But *Kantschuk* deals only with near end crosstalk (NEXT), and in fact *Kantschuk* initializes noise cancellation filters at start-up when the lines are free of FEXT interference [*Kantschuk*, col.6, ll. 37-40]. Amended claim 1 refers to an interference that includes far end crosstalk (FEXT) and exploits the correlation, at least in part to reduce the far end crosstalk in the interference.

Neither *Polley* nor *Kantschuk* teach or suggest a method of reducing interference noise and FEXT. *Polley* at col. 11 ll. 39-41 states that interference may contain NEXT, FEXT and white noise, but addresses FEXT no further. Since *Kantschuk* initializes noise cancellation filters at start-up when the lines are free of FEXT interference, the combination of *Polley* nor *Kantschuk* lacks any teaching of reducing FEXT as claimed by Applicants.

Additionally, amended claim 1 claims a method of reducing noise by transmitting a symbol vector, which has been multiplied by a pre-processing matrix at the transmitters, and multiplying received vectors by a post-processing matrix at the receivers. Neither *Polley* nor *Kantschuk* teaches or suggests multiplying a symbol vector by a pre-processing matrix at a transmitter and received symbols by a post-processing matrix at a receiver. Because neither *Polley* nor *Kantschuk* teaches or suggests a method of reducing interference noise including FEXT, and neither teaches or suggests multiplying by a pre-processing and a post-processing matrix as claimed in amended claim 1, Applicants contend that this claim is patentable over the combination of *Polley* and *Kantschuk*. Applicants' therefore respectfully request that this rejection be withdrawn.

Independent claims 13, 25, and 37 have been amended in a manner similar to claim 1 and are also patentable over *Polley* in view of *Kantschuk* for the same reasons stated above. Therefore, Applicants' respectfully request that the rejections for claims 13, 25 and 37 be withdrawn. Similarly, claims 3, 5-7, 15, 17-19, 27, 29-31, 39, 41, and 42, which depend from independent claims 1, 13, 25 and 37, are patentable over *Polley* in view of *Kantschuk*. Applicants' respectfully request that the rejections for these claims also be withdrawn.

The Examiner contends that claims 2, 14, 26 and 38 are unpatentable over *Polley* in view of *Kantschuk* and *Pakravan*. Claim 2 depends from claim 1, claim 14 depends from claim 13, claim 26 depends from claim 25, and claim 38 depends from claim 37. As discussed above, *Polley* in view of *Kantschuk* does not teach or suggest all of the elements of these independent claims. Additionally, *Pakravan* addresses interferences from external sources, but applies analog filters to reduce the interferences. *Pakravan* does not teach or suggest using pre-processing or post-processing matrices as claimed in independent claims 1, 13, 25 and 37. Because claims 2, 14, 26, and 38 depend from claims 1, 13, 25, and 37 respectively, they too are patentable over *Polley* in view of *Kantschuk* and *Pakravan*. Applicants' respectfully request that these rejections be withdrawn.

Conclusion

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing remarks given herein, Applicant respectfully believes this case is in condition for allowance and respectfully requests allowance of the pending claims. If the Examiner believes any detailed language of the claims requires further discussion, the Examiner is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved. The Examiner's prompt attention to this matter is appreciated.

Applicant is of the opinion that no additional fee is due as a result of this Amendment. If any additional charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

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Respectfully submitted,

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